Mithi Alexa de los Reyes

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Research Statement

I am broadly interested in using observations to study galaxy evolution. Much of my work focuses on chemical evolution and star formation in nearby dwarf galaxies.

Education

Doctor of Philosophy in Astronomy — Sept. 2017 - present
California Institute of Technology (Caltech), Pasadena, CA
Advisor: Evan Kirby
Expected to graduate in 2022

Master of Philosophy in Astronomy — Oct. 2016 - Jul. 2017
Institute of Astronomy, University of Cambridge, UK
Advisor: Rob Kennicutt

Bachelor of Science in Physics, Mathematics — Aug. 2012 - May 2016
North Carolina State University (NCSU), Raleigh, NC
Average unweighted GPA: 4.0/4.0

Awards and Honors

NSF Graduate Research Fellowship	2016
Winston Churchill Scholarship	2016
Astronaut Scholarship	2014 & 2015
Barry M. Goldwater Scholarship	2014
Park Scholarship (full-tuition merit scholarship to NCSU)	2012

Publications

Kennicutt, R.C. & **de los Reyes, M.A.** "Revisiting the Integrated Star Formation Law. Paper II: Starbursts and the Combined Global Global Schmidt Law." *The Astrophysical Journal* 908.1 (2021).

Shin, K., et al. (including **de los Reyes, M.A.**) "Metal Abundances across Cosmic Time (MACT) Survey. III. The Relationship between Stellar Mass and Star Formation Rate in Extremely Low-Mass Galaxies." *Monthly Notices of the Royal Astronomical Society* 502.2 (2021).

de los Reyes, M.A., Kirby, E.N., Seitenzahl, I.R., Shen, K.J. "Manganese Indicates a Transition from Sub- to Near-Chandrasekhar Type Ia Supernovae in Dwarf Galaxies." *The Astrophysical Journal* 891.1 (2020).

Kirby, E.N., et al. (including **de los Reyes, M.A.**) "Evidence for Sub-Chandrasekhar Type Ia Supernovae from Stellar Abundances in Dwarf Galaxies." *The Astrophysical Journal* 881.1 (2019).

de los Reyes, M.A. & Kennicutt, R.C. "Revisiting the Integrated Star Formation Law. Paper I: Non-Starbursting Galaxies." *The Astrophysical Journal* 872.1 (2019).

Kneller, J.P. & **de los Reyes, M.A.** "The Effect of Core-Collapse Supernova Accretion Phase Turbulence on Neutrino Flavor Evolution." *Journal of Physics G: Nuclear and Particle Physics* 44.8 (2017).

Ly, C., et al. (including **de los Reyes, M.A.**) "The Metal Abundance Across Cosmic Time (MACT) Survey I: Optical Spectroscopy in the Subaru Deep Field." *The Astrophysical Journal Supplement Series* 226.1 (2016).

de los Reyes, M.A., Ly, C., Lee, J.C., et al. "The Relationship Between Stellar Mass, Gas Metallicity, and Star Formation Rate for Hα-selected Galaxies at $z \approx 0.8$ from the NewHα survey." *The Astronomical Journal* 149.2 (2015): 79.

Selected Research Presentations

"Manganese Yields Indicate Sub-Chandrasekhar Type Ia Supernovae Dominate at Early Times in Dwarf Galaxies" Jan. 2020
235th American Astronomical Society Meeting
Honolulu, HI

"Star formation and chemical evolution in nearby galaxies" Oct. 2019
Invited colloquium speaker
Cal Poly Pomona Physics and Astronomy

"Using manganese to probe Type Ia supernovae in dwarf galaxies" Sept. 2019
Keck Science Meeting
University of California Los Angeles, CA

Poster: "Revisiting the Integrated Star Formation Law" Jan. 2019
233rd American Astronomical Society Meeting
Winner of 2019 Chambliss Astronomy Achievement Student Award
Seattle, WA

"Revisiting the Global Star Formation Law" July 2018
The Laws of Star Formation: From the Cosmic Dawn to the Present Universe
Institute of Astronomy, University of Cambridge, UK

"Manganese in Dwarf Galaxies as a Probe of Type Ia Supernovae" June 2018
232nd American Astronomical Society Meeting
Denver, CO

"An Update to the Global Star Formation Law" July 2017
Linking Observations and Theory Across the Scales of Star Formation in Galaxies
Sexten Center for Astrophysics, Italy

"The NewHα Survey: Investigating the Fund. Metallicity Rel. at $z \approx 0.8$" Jan. 2014
223rd American Astronomical Society Meeting
Washington, D.C.

Invited Outreach Presentations

"The Loneliest Galaxies in the Universe" Oct. 2020
San Diego Astronomy Association

"A Galactic Archaeology Dig" July 2020
California Academy of Sciences Virtual NightLife series

"The Loneliest Galaxies in the Universe" May 2020
Caltech Astronomy Stargazing and Lecture series

"Stars Go Boom" Jan. 2018
Astronomy on Tap - Los Angeles

Teaching Experience

Teaching assistant

- Assisted in multiple astronomy classes, with student evaluation scores:
  - Ay123 (graduate-level Stars), Fall 2018-19: 4.89/5
  - Ay124 (graduate-level Galaxies), Winter 2018-19: 5/5
  - Ay126 (graduate-level Interstellar Medium), Spring 2018-19: 5/5
  - Ay101 (undergraduate-level Stars), Fall 2019-20: 5/5
- Held office hours and exam review sessions, wrote problem set solutions, graded homework and exams
- Substituted for instructor on multiple occasions
- Created a hands-on final project assignment to analyze planetary nebula spectra

Guest lecturer

- Planned and delivered guest lectures on: stellar nucleosynthesis, star formation, stellar feedback, and stellar spectra for graduate and undergraduate classes
- Wrote homework problems (including interactive Juypter notebook problems) based on lecture material

Outreach and Professional Service

Astrobites collaboration Jan. 2017 - present

- *Admin committee co-chair* (Aug. 2020 - present): Helps make steering decisions for the Astrobites collaboration
- *Diversity, equity, and inclusion committee co-chair* (Apr. 2018 - Aug. 2020): Spearheaded initiatives to promote equity & inclusion, including multiple series of Astrobites posts (#BlackInAstro, Astronomy and Indigenous Communities), and a collaboration-wide climate survey
- *Policy committee chair* (Apr. 2018 - Aug. 2019): Coordinated with AAS Bahcall Public Policy Fellow to schedule posts on public policy
- *Author* (Jan. 2017 - Jan. 2019): Wrote undergraduate-level summaries of astronomy papers for Astrobites website

Caltech Women in Physics, Math, and Astronomy (WiPMA) Apr. 2018 - present

- *Organizing committee member* (Aug. 2018 - present): Plans and runs events on campus relating to women in PMA, including journal clubs and workshops
- *Acting president* (Feb. 2020 - Aug. 2020): Plans and runs meetings, keeps quarterly events on track
- *FUTURE of Physics co-chair* (Aug. 2019 - Oct. 2019): Organized two-day fly-out program to bring talented undergraduate women to Caltech; recruited and coordinated graduate student volunteers; ran multiple panels and workshops
- *Social media coordinator* (Aug. 2018 - Aug. 2019): Ran WiPMA social media accounts

Caltech Astronomy outreach Oct. 2017 - present

- Helps organize monthly Lecture and Stargazing Events, and assists events by either running a telescope or answering questions as part of a panel
- Participates in "guerrilla outreach" events, including Sidewalk Astronomy (set up telescopes in downtown Pasadena) and Science Train (ride the LA Metro and answer questions about astronomy)

Additional service

- *Graduate representative* (Jun. 2020 - present): Leads Astronomy department graduate student meetings; regularly checks in with students and serves as spokesperson for graduate students in the department
- *Respect is a Part of Research organizer* (Jan. 2020 - present): Helps organize annual peer-led training about preventing sexual violence and sexual harassment
- *Caltech Diversity, Equity, and Inclusion database manager* (Sep. 2020 - present): Helps maintain database for diversity, equity, and inclusion initiatives across campus
- *Caltech for Black Lives co-chair of outreach* (Aug. 2020 - present): Aggregates, shares, and evaluates opportunities for outreach in and around Caltech, guided by the requests from the Black Scientists and Engineers of Caltech in their June 2020 petition
- *PMA Student Advisory Board member* (Aug. 2019 - present): Serves as liaison between graduate students and Caltech Physics, Math, and Astronomy division
- *Toward a More Inclusive Astronomy consultant* (Jan. 2018 - present): Advises department-wide journal club discussing equity and inclusion issues in astronomy